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THE NATIONAL FORESTS OF IDAHO

PREPARED BY THE INTERMOUNTAIN AND NORTHERN DISTRICTS OF THE FOREST SERVICE

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EXTENT AND PURPOSES

The State of Idaho is endowed with unusual forest resources. Of the 53,346,660 acres of land within the State, about 23 million acres, or 43 per cent, is forested. Many large areas are owned by private individuals or companies; other forest lands belong to the State itself. Slightly over 19 million acres is held by the Federal Government as national forests.

A national forest is an area of public land set aside by congressional action to be managed in such a way that all its natural resources will be conserved. In this sense, conservation does not mean withdrawal from use. It simply means such use of the resources as will not impair the producing power of the land but will maintain or increase that producing power from year to year and from century to century.

The policy under which the national forests are administered has been clearly outlined by the Secretary of Agriculture in the following words:

> National forests have for their objects, to insure a perpetual supply of timber, to preserve the forest cover which regulates the flow of streams, and to provide for the use of all resources which the forests contain, in the ways which will make them of largest service. Largest service means greatest good to the greatest number in the long run. It means conservation through use, with full recognition of all existing individual rights and

with recognition also that beneficial uses must be use by individuals but without the sacrifice of a greater total of public benefit to a less. In other

FIG. 1.—The national forests of Idaho

words, the forests are to be regarded as public resources, to be held, protected, and developed by the Government for the benefit of the people.

Before the national forests were established there was danger that the timber might be destroyed by unwise methods of cutting and lack of protection from fire. This destruction of the timber would have entailed also the loss of the protection which the forests give to the watersheds, upon which depend the flow of streams and the supplies of water needed for irrigation, for power, and for domestic and municipal use. Accordingly, in 1897 the first national forest in Idaho was created by President Cleveland. Between that date and 1907 many additional areas in the State were designated as national forests by presidential proclamation. Since 1907, except for minor additions, there has been little change in the total area. At present there are 19 of these forests distributed over the entire mountainous portion of the State.

RESOURCES OF THE NATIONAL FORESTS

Although timber is the principal resource of the forests, they contain many other resources of great importance. The forage that grows among the trees, on the open slopes and in the grassy parks is grazed by about 1,585,000 head of livestock. The water flowing in the streams that originate in the forests is used in irrigating farms and in developing hydroelectric power. The forests themselves do not produce this water, it is true, but they assure a more dependable and uniform stream flow. Also as an incident to their situation, their character, and their management for timber, water, and forage conservation, the national forests contain many recreational resources and provide good camping, fishing, and hunting.

TIMBER

The Forest Industry

The forest industry is one of the three leading industries of the State of Idaho. The annual cut of lumber during the past 10 years has been about 821 million feet, as is shown in Table 1. The value of all Idaho's timber products for 1923 was approximately $39,000,000. It has been estimated that about 80 per cent of this amount remains within the State to pay for labor, supplies, and equipment. The relation of the forests to the business interests of the State is, therefore, very close, and their continuance on a permanent basis is of primary importance.

Table 1.—*Lumber cut in Idaho, 1915–1923 (all species).*

Year:	Board feet	Year:	Board feet
1915	777, 000, 000	1921	550, 077, 000
1916	846, 107, 000	1922	860, 161, 000
1917	749, 764, 000	1923	1, 073, 299, 000
1918	802, 529, 000		
1919	765, 388, 000	Average	821, 541, 000
1920	969, 576, 000		

Of approximately 83 billion board feet of standing merchantable timber in the State about 49 billion board feet is in the national forests, the remainder being on private or State land, or on public lands outside the national forests. (See Table 2.) Because the privately owned timber is more accessible it furnishes about 85 per cent of the present yearly cut of 821 million board feet. The total

stand of private timber is estimated at 25 to 26 billion board feet, and it is therefore clear that at the present rate of cutting the private timber in Idaho would last only about 36 years. Progress toward the point of exhaustion is especially rapid in northern Idaho, and, according to present indications, in some communities where

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FIG. 2.—A typical stand of western white pine and fir in north Idaho

the lumber industry is now most important a good many mills will have to be dismantled within the next 20 years. As the private timber is cut out, the national forests will take up the burden of production more and more. But the cutting of national forest timber is limited to the yearly growth which is about 557 million board

feet, and is neither sufficient in amount nor rightly located to fill the gap. (See Table 3 and fig. 3.) Prevention of fire on cut-over lands, reforestation, and scientific management of all forest lands, private as well as public, are necessary if timber production in the State is to be maintained at anything near the present rate.

TABLE 2.—*Distribution of timber in Idaho*

Distribution	Western white pine	Western yellow pine	Larch and Douglas fir	Lodgepole pine	Other species	Total
	Millions of board-feet					
NORTH IDAHO						
National forests	3,607	1,946	6,602	2,724	8,619	23,498
Indian reservations	164	146	241	----------	211	762
State forests	2,255	411	1,687	----------	1,907	6,260
Private woodlands	7,246	3,085	6,563	----------	5,699	22,593
Total, north Idaho	13,272	5,588	15,093	2,724	16,436	53,113
SOUTH IDAHO						
National forests	----------	8,568	8,081	4,531	4,150	25,330
State forests	----------	1,032	294	63	168	1,557
Private woodlands	----------	2,104	601	----------	300	3,005
Total, south Idaho	----------	11,704	8,976	4,594	4,618	29,892
Grand total	13,272	17,292	24,069	7,318	21,054	83,005

NATIONAL FOREST TIMBER POLICY

In handling the timber on the national forests, it is the policy of the Forest Service to cut only as fast as the timber can be replaced through growth. In general, the cutting is confined to mature timber which has ceased to make rapid growth, or it is in the nature of thinnings, by means of which increased growth can be obtained. As far as possible, the cutting is done so as to favor the most valuable species. The green trees to be cut are carefully selected and marked, and close utilization is obtained through cutting low stumps and using all the sound material in the trees. Slash is piled and burned or otherwise disposed of in order to reduce fire danger. Timber is sold by the thousand board-feet or by the piece, and is carefully scaled or counted, so that payment is obtained for the quantity actually cut.

The Forest Service does not undertake logging or the manufacture of timber products, but sells the timber which it wishes to dispose of to the highest bidder, the only exception being that under the law timber is sold to settlers and ranchers at a price which equals the cost to the Government of making the sale and supervising the cutting and brush disposal. Although a very great number of such sales is made, the total volume of timber involved is not large. Dead timber is given away freely to local residents for fuel and other purposes. Its removal is a distinct benefit to the forest, as its presence constitutes a fire danger and encourages insect depredations.

TABLE 3.—*Estimated sustained annual yield of Idaho national forests*

Forest	Thousand board-feet	Forest	Thousand board-feet
NORTH IDAHO		SOUTH IDAHO	
Clearwater	60,000	Boise	45,000
Coeur d'Alene	50,000	Cache	2,000
Kaniksu	[1] 31,000	Caribou	3,000
Nezperce	40,000	Challis	20,000
Pend Oreille	23,000	Idaho	50,000
St. Joe	25,000	Lemhi	8,000
Selway	50,000	Minidoka	3,000
		Payette	65,000
Total, north Idaho	279,000	Salmon	40,000
		Sawtooth	10,000
		Targhee	20,000
		Weiser	12,000
		Total, south Idaho	278,000
		Grand total	557,000

[1] Total yield. About 58 per cent of the Kaniksu National Forest lies in the State of Washington, and the Idaho yield is not shown separately

DISTRIBUTION OF FOREST SPECIES AND STANDS

The State of Idaho presents a wide range of forest conditions. In the north end of the "panhandle" and along the foothills of the Bitter Root Range as far south as the Clearwater River there was originally an almost unbroken forest of magnificent western white pine, cedar, hemlock, fir, and larch. Though much depleted by logging and by fire, it still contains the largest and finest western white pine stands in the United States.

To the south and west of the western white pine belt, toward the plains country, on the lower elevations having less precipitation, the western white pine forest gives way to an open yellow pine stand. This type of forest extends down through central Idaho, bordering the mountain ranges, which, at the upper elevations, carry chiefly lodgepole pine and Douglas fir. (See fig. 3.)

Idaho is exceptionally rich in coniferous tree species. The principal ones are western white pine, western yellow pine, western red cedar, larch or tamarack, white or grand fir, western hemlock, Douglas fir, lodgepole pine, Engelmann spruce, alpine fir, white-bark pine, limber pine, mountain hemlock, and Lyall larch. There are also some broadleaf trees—poplars, birches, willows, and alders—but they are of little commercial importance.

The most important timber species in Idaho is western white pine. It occurs in Idaho only north of the South Fork of the Clearwater River, its best development being reached in the vicinity of the North Fork of the Clearwater and continuing from there northward to the Canadian border. Some of the finest stands are situated on the Coeur d'Alene National Forest. White pine lumber sells for high prices, being better suited to many uses than the lumber of any other species. National forest sales of western white pine bring from $5 to $12 per thousand board feet on the stump. Considering the fact that much of it is difficult of access and entails heavy expense for logging improvements, this price indicates something of the favor which white pine lumber enjoys in the lumber markets of the country. The greater part of it is shipped to the Central and Eastern States.

The western white pine forest is a type of forest belonging to the deep-snow belt. In density and luxuriance of undergrowth it often approaches the coast forests. Western white pine is a magnificent tree, often attaining a height of nearly 200 feet, and it is not uncommon to find stands averaging 40,000 or more board feet per

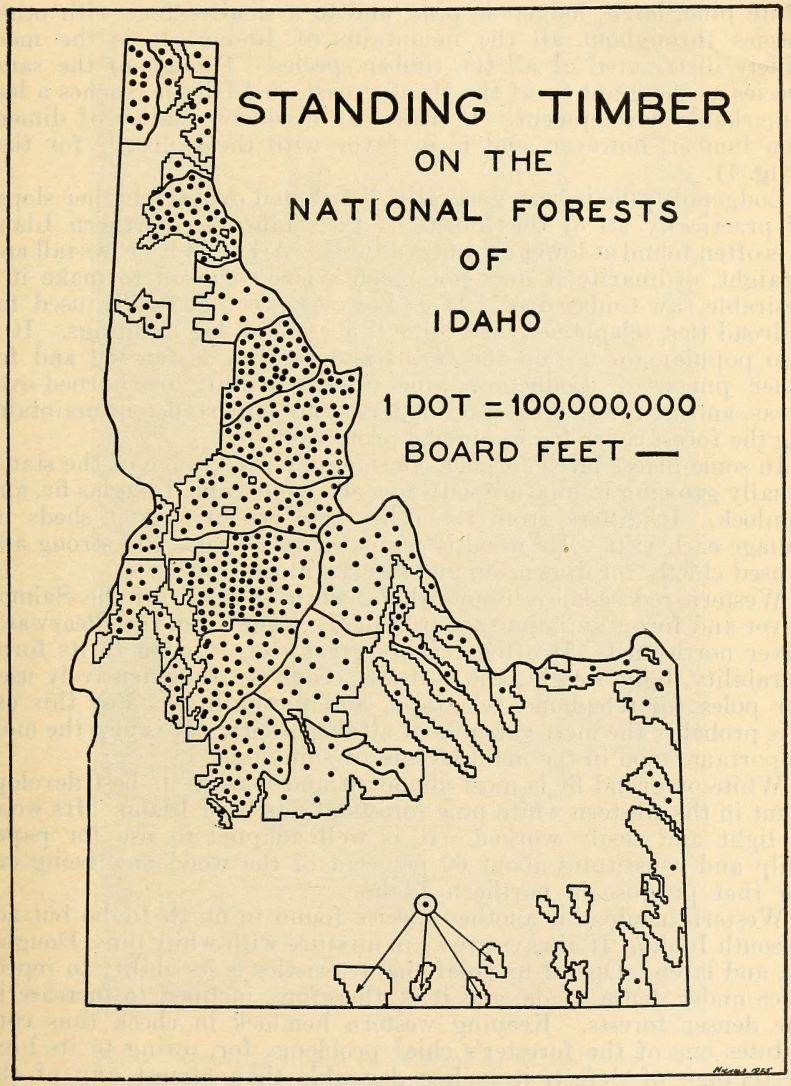

FIG. 3.—Standing timber in Idaho national forests

acre. It grows in the region of great fire danger, and its protection from fire is a serious problem.

Western yellow pine is second in importance in Idaho to western white pine, the cut being about the same but the value considerably less. It furnishes an excellent quality of lumber suitable for

general uses, and the stands are mostly very accessible. It grows at altitudes below the western white pine zone, and the heaviest stands are found in the westcentral part of the State. It occurs in more open stands with less brush than western white pine, and is, therefore, much more easily protected from fire.

Douglas fir commonly grows in mixture with yellow pine, western white pine, larch, lodgepole pine, and to a small extent with other species throughout all the mountains of Idaho. It is the most widely distributed of all the timber species. Though of the same species as the giant fir of the Pacific coast, in Idaho it reaches a less remarkable development. It makes an excellent quality of dimension lumber, however, and is in favor with the railroads for ties. (Fig. 4).

Lodgepole pine is very generally distributed over the higher slopes of practically all of the forests of the State. In northern Idaho it is often found at lower altitudes as well. Athough it grows tall and straight, ordinarily it does not reach a size sufficient to make it a desirable saw-timber tree. It is, however, very generally used for railroad ties, telephone poles, mine timbers, and log buildings. It is also popular for use on the farms and ranches as fencing and for other purposes. Lodgepole pine reseeds readily on burned-over areas, and is, for that reason, of particular importance in maintaining the forest cover for watershed protection.

In some places larch forms a considerable percentage of the stand, usually growing in mixture with western white pine, Douglas fir, and hemlock. It differs from the other conifers in that it sheds its foliage each year. Its wood is comparatively heavy and strong and is used chiefly for dimension and structural timbers.

Western red cedar is found almost entirely north of the Salmon River and forms an important part of the stand from the Clearwater River northward. It often reaches great size. Owing to its form, durability, light weight, and softness, cedar is very extensively used for poles for telephone, telegraph, and power lines. For this use it is probably the most valuable of all the species. It is also the most important wood in the manufacture of shingles.

White or grand fir is most abundant and reaches its best development in the western white pine forests of northern Idaho. Its wood is light and easily worked. It is well adapted to use for paper pulp and constitutes about 60 per cent of the wood now being cut for that purpose in northern Idaho.

Western hemlock is another species found in north Idaho but not in south Idaho. It always grows in mixture with white pine, Douglas fir, and larch. One of its chief characteristics is its ability to reproduce under dense shade, and it is, therefore, inclined to increase in the denser forests. Keeping western hemlock in check thus constitutes one of the forester's chief problems, for, owing to its high percentage of defect, it is less desirable than almost any of the other species with which it associates. For a long time it was regarded as useless and was not cut. On national forest sales operators are required to take all merchantable hemlock, and stands are cut quite heavily in order to remove the shade, which is favorable to its reproduction and detrimental to the reproduction of western white pine and other desirable species. Western hemlock makes satis-

factory paper pulp, a use for which it is now being cut, along with spruce and white fir.

Engelmann spruce is common throughout the higher altitudes in the State, particularly in damp canyons and on cold north slopes. It is a valuable lumber tree if well developed and makes excellent

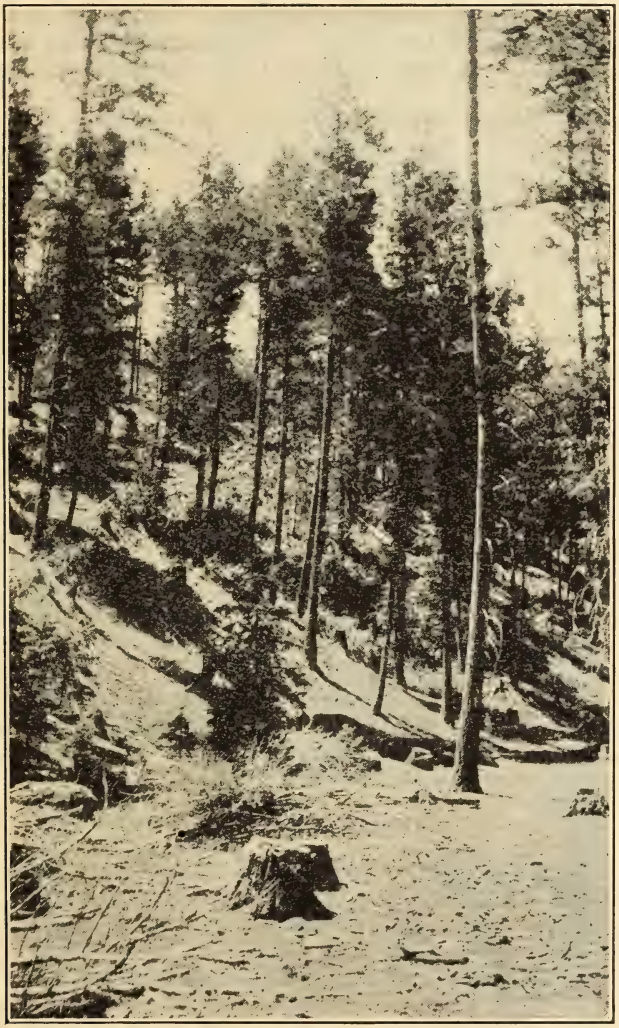

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FIG. 4.—A Douglas fir area in the Minidoka National Forest from which timber has been cut in accordance with Forest Service regulations

paper pulp, for which it is already being used in the northern part of the State. It also forms an important part of many of the protection forests.

Alpine fir is common in the higher altitudes throughout the forests of the State and is one of the two principal species at the extreme

upper limits of tree growth. At lower altitudes it grows in mixture with Engelmann spruce, lodgepole pine, and other species. It furnishes a poor quality of timber, for as the trees reach maturity they are likely to be defective. Combined with Engelmann spruce, Alpine fir makes satisfactory paper pulp.

The white-bark pine is usually a low-growing, many-branched tree. It grows on the rocky ridges in the high timber-line country in practically all parts of the State. Valuable mainly as watershed protection, it is also of some value for fuel and mine timbers.

TABLE 4.—*Stand of national forest timber by forests and species*

Forest	Western white pine	Western yellow pine	Douglas fir	Lodgepole pine	Larch	Cedar	Spruce	Other	Total
	Millions of board feet								
Clearwater	1,221	45	782	144	454	343	650	802	4,441
Cœur d'Alene	1,273	136	783	37	411	34	41	634	3,349
Kaniksu [1]	383	8	123	12	123	285	44	225	1,203
Nezperce		1,057	1,280	1,452	327	14	227	740	5,097
Pend Oreille	271	121	109	20	222	114	197	201	1,255
Selway	58	568	1,539	999	49	488	1,099	1,976	6,776
St. Joe	401	11	184	60	216	109	295	101	1,377
Total, north Idaho	3,607	1,946	4,800	2,724	1,802	1,387	2,553	4,679	23,498
Boise		2,026	844	256			25	225	3,376
Cache [1]			55	21			21	26	123
Caribou [1]			95	33			12	19	159
Challis			528	618			4	540	1,690
Idaho		2,746	2,139	1,891	100		566	936	8,378
Lemhi			200	191			36	160	587
Minidoka [1]			38	21				22	81
Payette		1,876	1,000	500				983	4,309
Salmon		1,060	1,658	356			132	93	3,299
Sawtooth		90	331	121			14	50	606
Targhee [1]			509	523			90	76	1,198
Weiser		770	584					170	1,524
Total, south Idaho		8,568	7,981	4,531	100		900	3,250	25,330
Grand total	3,607	10,514	12,780	7,255	1,902	1,387	3,453	7,929	48,828

Figures apply only to the portion of the forest in Idaho.

FORAGE RESOURCES

Out of a total of 2,250,000 sheep and 510,000 beef cattle in the entire State of Idaho, approximately 1,425,000 sheep and 160,000 cattle (this figure also includes 2,000 horses) are grazed under permit on the national forests each year. Of these, about 1,360,000 sheep and 153,000 cattle and horses are carried by the national forests of the southern part of the State, which are more open than those of northern Idaho and include great areas suitable for livestock. (Figs. 5 and 6.)

Unregulated grazing may be very destructive, for concentrating too many animals on a limited area kills the forage as well as the young trees that must be preserved in order to maintain the forest. Accordingly, on the national forests all grazing is carried on under regulations that limit the number of stock on each area. Rules for the management of the range stock are also in force, which aim to

prevent overgrazing and yet to bring about full utilization of the forage. Men trained in range management are employed by the Forest Service to work out a definite plan of management for each range. Careful surveys are made to determine the quantity and

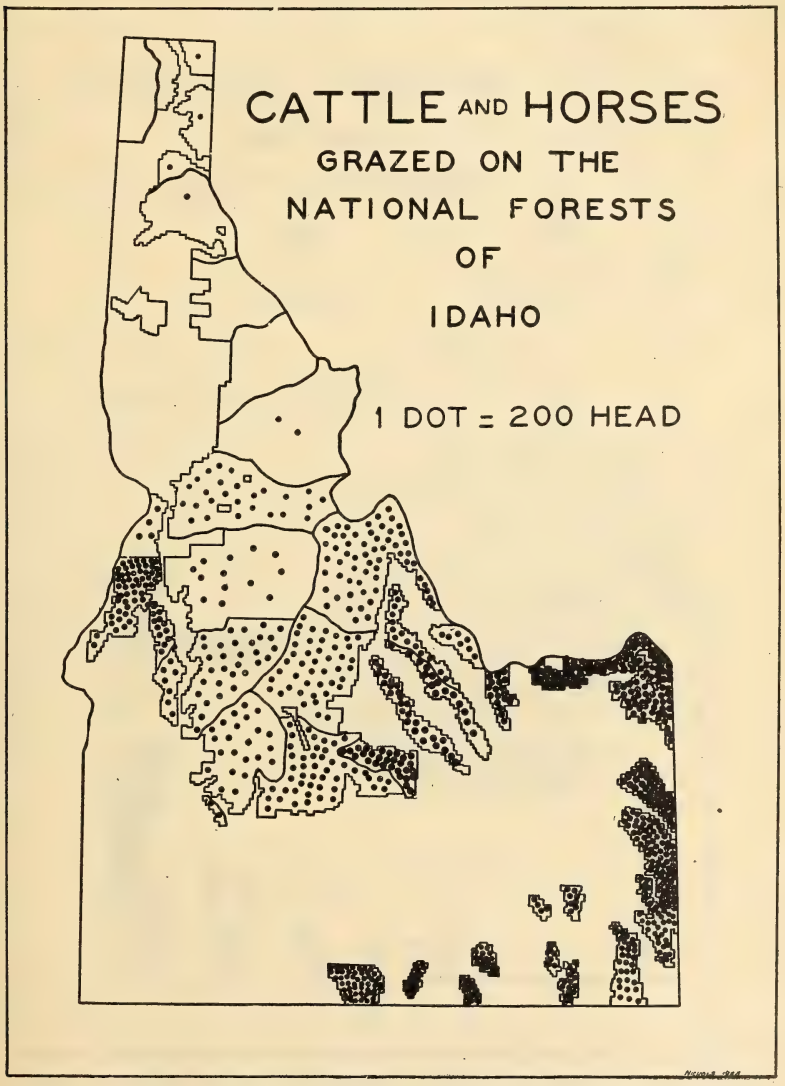

FIG. 5.—The national forests of Idaho are important grazing lands for cattle

kinds of forage plants in each locality, and from these surveys it is possible to determine how many sheep or cattle the range is able to support.

An effort is made to insure a stable livestock industry in the country served by the national forests. Permittees who have es-

tablished grazing preferences through prior use and occupancy are given first consideration. In awarding privileges to new owners, preference is given to local ranchers who are dependent upon the

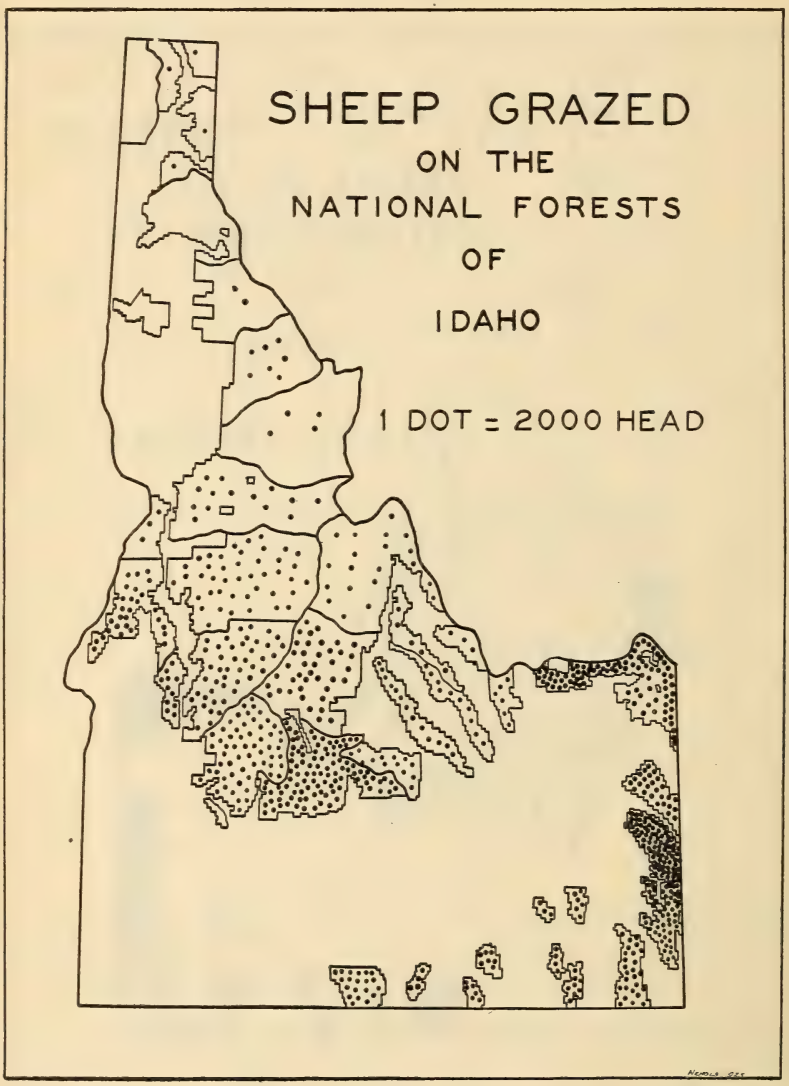

FIG. 6.—Many thousand sheep range in summer on the national forests of Idaho

neighboring forest land to summer their stock. When this class of applicants has been provided for the rest of the range available for new permittees is allotted to owners farther away, to whom the use of the forest range is less essential.

TABLE 5.—*Number of livestock actually grazed on national forests of Idaho, season of 1924*

North Idaho			South Idaho		
Forest	Cattle and horses	Sheep and goats	Forest	Cattle and horses	Sheep and goats
Clearwater		15,701	Boise	4,804	118,287
Coeur d'Alene	126	150	Cache	24,865	92,517
Kaniksu	5	768	Caribou	18,860	233,936
Nezperce	6,113	33,876	Challis	7,957	65,378
Pend Oreille	508	4,831	Idaho	2,262	84,015
St. Joe	31	2,449	Lemhi	16,128	84,031
Selway	255	6,360	Minidoka	19,402	75,151
			Payette	6,238	109,625
Total, north Idaho	7,038	64,135	Salmon	15,767	56,030
			Sawtooth	8,037	200,857
			Targhee	18,049	192,410
			Weiser	11,194	48,199
			Total, south Idaho	153,563	1,360,436
			Grand total	160,601	1,424,571

WATERSHED VALUES

One of the basic purposes for which the national forests were established was the protection of the watersheds. Water is of vital importance in Idaho for irrigation and the development of hydroelectric power, to say nothing of domestic and municipal use. Virtually all the streams of importance for irrigation or for power gather their volume on the high, forested slopes within the national forests. Of the 42,106 farms in Idaho, 25,283, or 60 per cent, are irrigated, and approximately 55 per cent of the improved land on these farms is watered. Investments totaling $91,000,000 have been made in irrigation works. It is also estimated that these streams are capable of generating at least 2,000,000 horsepower. These values are not confined to Idaho alone, for just as Idaho uses water that originates outside of its borders on the head of the Snake River in Wyoming, so it passes on to Oregon and Washington vast quantities of water to be used in irrigation and power development in those States.

Although it is true that no mistreatment of the mountain watersheds could ever wholly destroy this resource, nevertheless a large part of its value might readily be wiped out if the cover of timber and herbage were removed. Such destruction of values might come about in many ways. The most spectacular, of course, is floods, which, rushing out of the mouths of the canyons where the watersheds have been denuded, spread disaster over the fertile farm lands below. Persistent erosion in streams rising on barren watersheds is even worse, because it continues year after year unless the watershed cover is restored. Such streams invariably carry with them, even after normal storms, surprising quantities of silt, sand, and even gravel and rock, which make the problem of reservoir and canal maintenance very difficult. Operating costs on the irrigation and power projects are increased to a remarkable degree, and may become so serious as to make the projects entirely unprofitable. In addition, destruction of the cover on mountain watersheds tends to bring about

heavy run-off in the spring and low water through midsummer. This waste reduces the amount of water available for irrigation at the very time of the year it is needed most, and curtails the amount of power that may be generated. (Fig. 7.)

Forest fires, overgrazing, and reckless cutting of timber are the primary destructive agencies which can convert a green slope on an important watershed into a denuded waste. Especially is this true in south Idaho, where the water resources of the mountains have their highest value and where nature finds it more difficult to heal scars caused by fires or overgrazing.

RECREATION

The national forests were created to produce timber and regulate stream flow, but they have many other uses incidental to these main purposes, one of which is recreation. The forests of Idaho

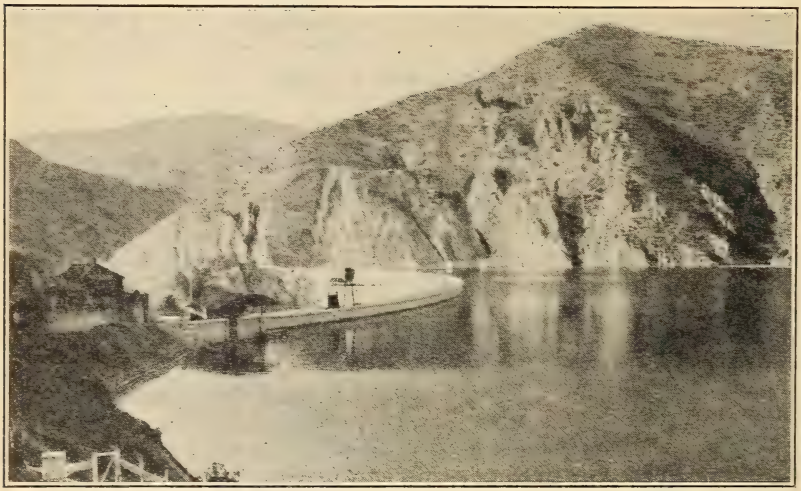

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FIG. 7.—The Arrowrock is one of the many reservoirs whose water comes from a watershed protected by national forests

contain a wide variety of scenery, which is everywhere attractive and in many places inspiring.

Many parts of the forests are easily reached by automobile. Some of them are traversed by main highways, and others are to some extent accessible through branch roads. They also contain many large areas that can be reached only by pack trail or on foot without the aid of trails. In fact, they contain relatively large areas of what is popularly termed "back country," where, with the exception of the Forest Service trails, telephone lines, and lookout stations, the country remains in its natural state. It is in this back country that the best fishing is to be had and that the larger game animals still exist in great numbers. It has been estimated that the national forests of Idaho support 40,000 large game animals—white tail and black tail deer, elk, moose, mountain sheep, mountain goats, and bear.

Practically all the streams of the national forests are clear and cold, forming ideal water for the different varieties of trout. The Salmon and Clearwater Rivers are especially noted for their salmon runs. In general roads and trails are so located with regard to the streams that the natural camping places also afford excellent fishing. The high mountains and beautiful scenery also afford inducements to the mountain climber and camera hunter.

It is the policy of the Forest Service to encourage the use of the forests for recreation and to develop their recreational resources along with timber production and water-shed protection.

Generally no charge attaches to recreational use of the forests. Except in severe fire seasons and on areas of special fire hazard, everyone is free to come and go as he pleases, being required only to be careful with fire and to leave the streams and camp grounds undefiled and uninjured. Only when a special privilege, such as the private control of a site for a summer home or for a hotel resort, is desired and is permissible, is a charge made.

Forest officers are always glad to give information to those coming or planning to come to the forests.

HOW THE NATIONAL FORESTS ARE HANDLED

ORGANIZATION OF THE FOREST SERVICE

The national forests are administered by the Forest Service, a branch of the United States Department of Agriculture, with headquarters at Washington, D. C. For convenience in managing the national forests, which are scattered over the United States, with two in Alaska and one in Porto Rico, the country has been divided into eight districts, six of which lie in the Rocky Mountain and Pacific coast regions of western United States. The national forests of Idaho are in two of these districts. Those of north Idaho are in district 1, with headquarters at Missoula, Mont.; and those in south Idaho in district 4, which is administered from Ogden, Utah. Each national forest is in direct charge of a forest supervisor, who is assisted by trained foresters where there are important problems to be solved. There are 19 national forests in Idaho, covering virtually all of the mountain ranges in the State from the Canadian border to Utah. A list showing the names of these forests and the town in which the supervisor has his headquarters is given in Table 6.

TABLE 6.—*National forests of Idaho—headquarters and area*

NORTH IDAHO

Forest	Headquarters	Area in acres	
		Gross	Net
Clearwater	Orofino	907,846	785,376
Coeur d'Alene	Coeur d'Alene	790,234	661,769
Kaniksu	Newport, Wash.	[1] 280,857	[1] 186,986
Nezperce	Grangeville	1,703,154	1,659,392
Pend Oreille	Sandpoint	874,738	674,579
Selway	Kooskia	1,802,000	1,688,918
St. Joe	St. Maries	867,450	551,170
Total, north Idaho		7,226,279	6,208,190

[1] The portion of the forest that lies in Idaho.

TABLE 6.—*National forests of Idaho—headquarters and area*—Continued

SOUTH IDAHO

Forest	Headquarters	Area in acres	
		Gross	Net
Boise	Boise	1,121,195	1,062,797
Cache	Logan, Utah	[1] 508,538	[1] 494,161
Caribou	Montpelier	[1] 734,714	[1] 698,255
Challis	Challis	1,265,816	1,253,583
Idaho	McCall	1,891,293	1,856,789
Lemhi	Mackay	1,367,171	1,354,964
Minidoka	Burley	[1] 545,076	[1] 521,071
Payette	Emmett	1,239,139	1,202,153
Salmon	Salmon	1,687,127	1,664,160
Sawtooth	Hailey	1,177,821	1,158,551
Targhee	St. Anthony	[1] 1,053,423	[1] 1,011,545
Weiser	Weiser	665,029	566,241
Total, south Idaho		13,256,342	12,844,270
Grand total		20,842,621	19,052,460

[1] The portion of the forest that lies in Idaho.

Each national forest is subdivided into ranger districts, each of which is in charge of a forest ranger. The rangers constitute the permanent organization and are employed throughout the year. During the summer season a large number of temporary employees are hired to assist in preventing, discovering, and suppressing forest fires. They act as lookouts, firemen, or patrolmen.

The forest ranger is responsible for the protection and administration of his district, which usually includes from 100,000 to 150,000 acres. He supervises and directs the timber sales and the grazing, recreational, and other uses within his district. He builds roads, trails, bridges, telephone lines, and other permanent improvements. During the long, dry summer season he directs the fire-protection organization of his district. A ranger must be sound in body, for he is called upon to work for long periods at a strenuous pace, in all kinds of weather. He must know how to pack supplies and take care of himself and his horse in regions where he is thrown entirely upon his own resources. He must also have executive ability properly to handle the business and give adequate public service.

The entire personnel of the Forest Service is selected through civil-service examinations, each individual being chosen on account of special fitness to handle the work intrusted to him.

FOREST FIRES

In order to maintain growing forests and obtain from them the greatest production of timber, it is absolutely necessary to keep down forest fires. The forests of Idaho have always been subject to conflagrations; evidences are everywhere apparent of fires that occurred even before the earliest records were kept. Originally, it may be presumed, these fires were largely the result of lightning, and the Indians, who were the only inhabitants of the region, made no effort to extinguish them. The coming of the white man, with the later settlement and development, the clearing of land for agriculture, logging operations, and general utilization of the forests for camping and recreation, have greatly increased the number of

fires. Records kept during the past eight years indicate that now only about half the fires are caused by lightning and that the remainder are due to the activities and carelessness of man.

Both the climate and the forest conditions prevailing are such as to make the fire danger, particularly in northern Idaho, very great. There is regularly a long period of drought in the summer season, during which the dead timber and duff of the forest floor become extremely dry. Strong winds are also common at this season of the year. Perhaps the most dangerous factor, however, is the unusually low humidity. The summer is also the season of severe lightning storms. During many of these storms, known locally as "dry storms," electricity discharges to the ground with great frequency. For example, on July 1, 1924, a single lightning storm set over 100 fires in the Clearwater Forest alone, and many other storms have almost equaled this record. The prevailing winds are westerly, and in bad fire years the smoke haze, drifting in from the fires in the valleys and mountains at a distance, as well as that which is produced by local fires, becomes so dense that lookouts are unable to discern the smoke of new fires starting up.

There is often a great accumulation of dead and down material underneath the dense forests, as well as a heavy cover of brush and weeds of various kinds, adding both to the fuel which feeds the fire and to the difficulty of fire-line construction. In fact, all the conditions which increase fire danger seem to combine in the forests of this region.

Probably the most disastrous fires since the forests of Idaho were placed under the protection of the Forest Service occurred in 1910. A number of forest fires had been burning for days in northern Idaho and western Montana. Hundreds of fire fighters were in the hills trying to check the spread of flames. The curtain of smoke became so dense that lookouts were almost entirely useless. On the evening of August 20 the wind sprang up and rapidly grew to the velocity of a hurricane. The fires broke all bounds. Flaming brands were picked up and carried from crest to crest of the ridges, dropping on the slopes and in the canyon bottoms between. Human effort bacame entirely unavailing. The problem of the fire fighters became one of self-preservation. In spite of all efforts and many deeds of heroism 80 lives were lost. Scores of hairbreadth and almost miraculous escapes were recorded. The mining city of Wallace, situated in a canyon, was set ablaze by falling brands, and all the outlying portions as well as part of the business section of the town were destroyed. Small mining towns, lumber camps, and homesteads were wiped out. Some of the fires ran together, in one case making practically a solid burn extending more than 100 miles east and west. Altogether, over 2½ million acres of forest, some of it of the finest western white-pine type, were destroyed.

In 1919 another unusually dry season came on, and in spite of the hundreds of men employed, 1⅓ million acres in northern Idaho and western Montana were burned over and timber worth millions of dollars was destroyed. The cost of fire fighting alone was $2,800,000. In 1922 another serious situation arose, and heavy losses occurred. Three times in 1924 conditions in northern Idaho again became critical.

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The problem resolves itself into one of reducing man-caused fires to the lowest possible minimum and of organizing thoroughly enough to put out the fires that do start while they are small and can be handled. The first can be done only through inducing people to use greater care with fire. State and Federal laws now place many restrictions on the use of fire in the dangerous season, and through education the public is becoming very much better informed as to the damage which fires do and the care which is essential. It is now unlawful to set fire in slashings for the purpose of clearing land or disposing of brush during the dangerous season without a permit from a forest officer or State fire warden. Restrictions are also placed by law on setting and leaving camp fires and on throwing away lighted matches or cigarette stubs. More than 2,000 Federal forest rangers and guards and State fire wardens are on the ground throughout the fire season, enforcing these laws, urging on the public care with fire, and directing the work of fire fighting.

The building up of a force of men with the equipment needed to prevent and suppress fires under these conditions is a vast and expensive undertaking. Added to this is the necessity of building telephone lines, lookout stations, roads, and trails, in order to make it possible to discover and report fires quickly and to provide means of transportation. For transporting men, supplies, and equipment over the trails hundreds of pack horses are maintained by the Forest Service. A large central warehouse for storing supplies and equipment is maintained at Spokane, and many smaller warehouses where supplies sufficient for immediate needs are always on hand are located within the forests.

A sufficient number of fire lookouts are placed on the high mountain peaks, so that every part of the forest can be seen by one or more of them. The men on duty at these lookouts must know thoroughly the country which their stations overlook. Each lookout is connected with headquarters by telephone and reports at stated times each day, as well as making special calls when fires are discovered and reporting the progress of fires that are burning. By means of an alidade or other instrument and a map he is able to give the exact location of any fire that starts. (Fig. 8.) Other men, known as "smoke chasers" or forest firemen, are employed and stationed at advantageous points, to be immediately dispatched when fires are reported. These men must also know the country thoroughly. Many of them must travel on foot, carrying their rations and fire-fighting tools on their backs, as it is frequently necessary to leave all trails in order to reach the fires.

About 1,250 lookout men and smoke chasers are employed each year on the national forests of Idaho, and about as many more men who are employed in the building of roads, trails, and telephone lines are held in readiness for fire fighting at any time. Most of these construction men are employed on trail building in the most inaccessible country, where they often prevent the spread of fires which start and which would otherwise be extremely difficult and expensive to handle because of the time lost in reaching them. The employment of these men reduces the cost of fire fighting, and when there are no fires they are used in making the forests more accessible, thus rendering the fire situation easier to handle. For information

in regard to the number of fires, causes, area burned, damage, etc., see Table 7.

TABLE 7.—*Forest fires in Idaho, from the records of the Forest Service*[1]

Year	Number man caused	Number caused by lightning	Total number	Percentage man caused	Number of acres burned	Damage
Average for five years, 1916–1920, inclusive [2]	634	635	1,269	50	313,833	$810,939
1921	706	439	1,145	62	34,204	48,589
1922	706	1,003	1,709	41	83,135	776,684
1923	302	533	835	36	24,531	209,928
8-year average	610	644	1,254	49	213,880	636,237

[1] Includes fires reported on all forest lands in the State.
[2] No complete figures available prior to 1916.

Owing to the extreme fire danger in the forests of Idaho, a number of laws are in effect the object of which is to reduce the number of

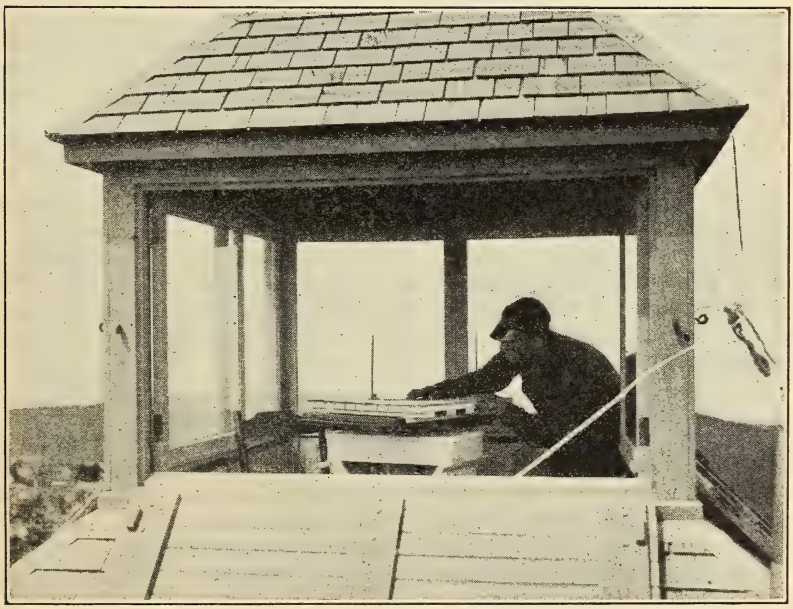

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FIG. 8.—Striped Peak lookout, Coeur d'Alene National Forest, Idaho

DIGEST OF FEDERAL AND STATE FIRE LAWS

man-made fires by imposing fines and imprisonment for carelessness with fire or for malicious burning of the woods.

Penalties have been provided by law for the following acts:

(1) Setting fire to timber, brush, or grass.
(2) Building fires in dangerous places, especially in dry leaves, rotten wood, or against logs and stumps.
(3) Building fires in windy weather except in holes or cleared areas.

Penalties have been provided by law for the following acts—Contd.

(4) Leaving fires unextinguished or allowing them to spread.
(5) Throwing away lighted matches, cigars, or cigarettes, or smoldering pipe tobacco.
(6) In times of special danger:
  A. Building camp fires upon prohibited areas.
  B. Smoking on prohibited areas.
  C. Going on areas closed to public travel on account of fire danger.

The removal or defacement of fire notices or warnings posted anywhere by the authority of the State or the United States is also prohibited.

Six Rules For Preventing Fire In The Forest

(1) *Matches.*—Be sure your match is out. Break it in two before you throw it away.

(2) *Tobacco.*—Be sure that pipe ashes, and cigar or cigarette stubs are dead before throwing them away. Never throw them into brush, leaves, or needles.

(3) *Making camp,*—Before building a fire, clear away all inflammable material from a spot 5 feet in diameter. Dig a hole in the center, and in it build your camp fire. Keep your fire small. Never build it against trees or logs or near brush.

(4) *Breaking camp.*—Never break camp until your fire is out—dead out.

(5) *Brush burning.*—Never burn slash or brush in windy weather or while there is the slightest danger that the fire will get away.

(6) *How to put out a camp fire.*—Stir the coals while soaking them with water. Turn small sticks and drench both sides. Wet the ground around the fire. If you can't get water, stir in dirt and tread it down until packed tight over and around the fire. Be sure the last spark is dead.

FOREST IMPROVEMENTS

When the forests of Idaho were created they were in a large measure undeveloped by roads or trails, and there were practically no telephone lines or other means of communication. The effectiveness of forest protection depends to a large extent on the nature of the transportation and communication systems, and the construction of these improvements has from the start been one of the important lines of national forest work.

Up to the present time the Forest Service has constructed 1,664 miles of roads in Idaho at a total cost of $3,761,510. In order to reach the inaccessible portions of the forests, 8,831 miles of trail have been built at a cost of $1,275,670. For communicating fire reports and transacting forest business 5,510 miles of telephone lines have been built at a cost of $428,427. Nearly 100 lookout stations have been established in the national forests of the State.

Various other improvements, such as ranger-station dwellings, barns, and fences have been constructed in order to provide headquarters for rangers and guards, and the necessary pasturage and shelter for Government stock. Including the cost of constructing bridges, warehouses, and miscellaneous improvements the public has a capital investment in improvements on the Idaho national for-

ests amounting to about $6,170,000. A considerable sum is annually expended for the maintenance of these improvements.

Many more miles of roads and trails are needed to make the forest really accessible and to reduce the difficulties of fire protection. These roads and trails will also be of great service to the public. The work of improving the forests up to the desired standard is being carried steadily forward, but many years will be required to complete it.

FOREST PLANTING

As a general rule when virgin timber is swept by forest fires, the area reseeds naturally. If, however, a second fire occurs before the young growth is old enough to bear seed the destruction is often

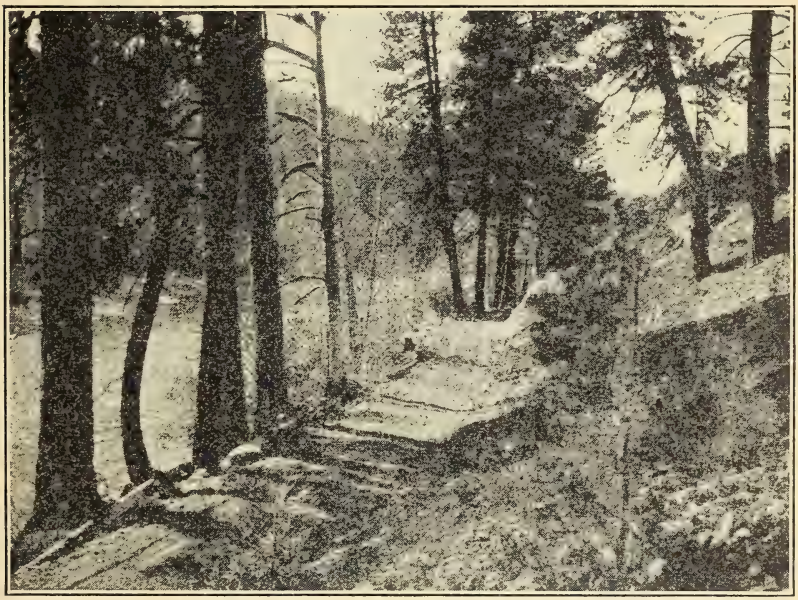

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FIG. 9.—A dirt road built to open up national forest resources

complete and reseeding does not occur, so that the areas are left in a devastated condition. In order to make them again productive it is necessary to resort to planting. Approximately 200,000 acres on the national forests in north Idaho are in need of planting to restore the forest growth and put them again in a productive condition. Since 1914, when the planting program of the Forest Service was started in Idaho, about 20,000 unproductive acres have been planted, chiefly with western white pine and yellow pine. These plantations have been very successful in general, and on approximately 90 per cent of the areas a new stand has been established. Under the present program about 3,000 acres a year are planted in north Idaho. The cost of planting, including the nursery stock, has averaged about $10 per acre.

The planting stock used is grown at the Savenac Nursery, at Haugan, Mont., a few miles east of the Idaho line. This nursery,

the largest of all the Forest Service nurseries, produces about 3,000,000 plants a year, the greater part of which are used in Idaho.

INVESTIGATIVE WORK

Supplementing its direct administration of the national forests, the Forest Service conducts investigations on the growth and management of the forests and on the utilization of wood. The aim of the first is to determine how the greatest production of the most valuable timber can be obtained on all forest lands. That of the second is to make possible the complete and most economic utilization of all forest products.

In order to carry out growth and management investigations effectively, a number of forest experiment stations have been established in various parts of the country. The work for the greater part of north Idaho is covered by the Priest River Experiment Station, founded in 1912 and now known as the Northern Rocky Mountain Experiment Station. Although its headquarters are at Missoula, Mont., the field station for experiments in the western white pine type is located 15 miles north of the town of Priest River, Idaho. Here some 4,000 acres of adjacent mountain land have been set aside as an experimental forest. On this tract are being worked out experimentally the most suitable methods of cutting and brush disposal and the systems of thinning to be used for the large-scale timber operations in the national forests of that section. In addition, annual cutting, on the basis of sustained yield, is being conducted with a view to developing this tract as a demonstration forest to illustrate the methods of intensive timber growing and harvesting on small tracts. The Northern Rocky Mountain Experiment Station, with its small staff of trained foresters, is now the center of numerous management investigations, the results of which are applied on the national forests and are made available to private timber owners for use on their lands.

The forest products investigations of the Forest Service are conducted by the Forest Products Laboratory at Madison, Wis., and by the forest products offices in the western districts. The products office at Missoula, Mont., carries on studies in north Idaho in regard to logging, milling, kiln drying, air seasoning, and wood preservation.

THE KANIKSU NATIONAL FOREST

Only 186,986 acres of the Kaniksu National Forest lies in Idaho. The rest is in the State of Washington and includes most of the timbered country lying between the Idaho boundary and the Clark Fork of the Columbia. The net area of the forest in both States is 444,593 acres.

In spite of its relatively small size, it is important as a timber-producing forest. There is now more than 2 billion board feet of merchantable timber on the whole area, a large percentage of it valuable western white pine and cedar. For the past five years the annual cut has been 20 million board feet, which could be increased to 31 million board feet without exceeding the amount grown each year.

The mountains of the Kaniksu Forest are spurs extending southward from the Shelkirk Mountains of Canada.

Practically the entire eastern boundary of the forest is formed by Priest Lake and Priest River. To the east of this boundary lies a tract of about 212,000 acres of timbered country, owned principally by the State of Idaho and containing a great deal of valuable timber.

Most of the towns located along the Clark Fork depend on the lumber industry for existence. Sawmills are located at Priest River, Newport, Dalkena, Cusick, and Ione.

There are a number of mountain lakes on the forest, the most important of which are Priest Lake and Sullivan Lake, both of which can be reached by good roads. Sullivan Lake is used as a reservoir for water power by a plant at Metaline Falls.

On the west side of the forest, at a point a few miles south of the Canadian boundary, the Clark Fork River forms the famous Z Canyon, which is considered one of the three largest undeveloped power sites in the world. At one point the river literally turns on edge in order to pass through a gorge only 18 feet wide.

Most of the forest is fairly accessible by roads and trails. Hotel accommodations may be obtained at Coolin, at the southern end of Priest Lake, and many suitable camp grounds are also available. There is considerable demand for summer-home sites on Priest and Sullivan Lakes, and the Forest Service has already made plans to meet this demand.

The Priest River Field Station of the Northern Rocky Mountain Forest Experiment Station is located on the road between Priest River and Coolin. The public is invited to visit this experimental area, and forest officers will be glad to explain how the many problems of forestry in this region are being investigated and worked out there.

PEND OREILLE NATIONAL FOREST

The Pend Oreille National Forest extends from the Canadian boundary southward to the Coeur d'Alene Mountains, a distance of over 80 miles. Its eastern boundry is the Montana State line and its western boundry is the crest of the divide which separates the drainages of the Kootenai and Priest Rivers; the southern boundry includes the greater portion of Lake Pend Oreille, the largest body of water within the State. The forest is crossed by two main streams, the Kootenai and the Clark Fork, which join the Columbia River after crossing into Canada.

Lake Pend Oreille was named by French-Canadian voyageurs from its fancied resemblance to an ear. The bathing, boating, and fishing afforded by this body of water make it a summer resort for the surrounding territory. Much of the region included within the forest is extremely rugged, and forms the background for tumbling mountain streams and many lakes which abound with fish. The lakes furnish breeding and feeding grounds for countless waterfowl. Deer and bear, as well as game birds, are plentiful. On the whole, the region is made quite accessible by a network of roads and trails. A number of small towns are to be found in the valleys, from which the more remote mountain country can be reached.

The Pend Oreille Forest has an annual timber growth of approximately 23,000,000 board feet and the total of its timber sales is approaching this amount. In 1924 its receipts, largely from the sale of timber, amounted to $55,541.01.

COEUR D'ALENE NATIONAL FOREST

The Coeur d'Alene National Forest extends from the summit of the Bitter Root Mountains, which form part of the Montana-Idaho State line, westward to Coeur d'Alene and Hayden Lakes, which mark the boundry of the timbered country. Within the forest rise several branches of the Coeur d'Alene River. Stevens Peak, the highest of its mountain peaks, has an elevation of 6,826 feet. Although the country is not high above sea level, the topography is very broken. The whole forest is made up of rugged hills and steep-sided canyons.

The region is rich in historical interest. In the period from 1858 to 1862 Capt. John Mullan built his famous military road from Fort Benton in Montana to Walla Walla, on the Columbia River in Washington. Many traces of this early road, which traversed the forest from east to west, may still be seen. A large white pine tree on which are carved initials and the date "July 4, 1861," is still standing near the head of Fourth of July Canyon, and forms a point of interest much visited by tourists. Near Cataldo, on the Coeur d'Alene River, an old Jesuit mission, remarkable for the fact that it was constructed entirely without the use of nails, stands as a reminder of the pioneer days of this region. It is still used for religious services.

The Yellowstone Trail crosses the southern part of the forest, highways follow the shores of Lake Coeur d'Alene for miles, and secondary roads lead into the very heart of the heavily timbered western white pine country. Wallace and Kellogg, centers of the great silver and lead industry of the region, are accessible by railroad. Steamboats ply the waters of Coeur d'Alene Lake between Coeur d'Alene and points along the shore.

The chief industries of the forest are mining and lumbering. With the discovery of silver-lead ore in the early eighties began the development of the mining industry, which has now reached great proportions. The many sawmills on Lake Coeur d'Alene and the Coeur d'Alene River are supplied in part by logs cut on the national forests.

The Coeur d'Alene National Forrest grows about 50,000,000 board feet of timber annually, and the average yearly timber sales approach this amount.

The principal timber species on this forest is western white pine, considerable quantities of which are purchased by match companies and shipped east to the factories.

ST. JOE NATIONAL FOREST

The main division of the St. Joe National Forest includes the headwaters of the St. Joe River and the Little North Fork of the Clearwater. On the north and east are the St. Joe and Bitteroot Mountains. The southern boundary is formed by a range of rugged

peaks known as the Sawteeth. The interior of the forest is broken into rugged peaks and undulating ridges. The St. Joe River, often referred to as "the shadowy St. Joe," winds for miles between precipitous canyon walls, and is one of the most picturesque streams in the northern part of the State.

The Palouse division, located between Potlatch and St. Maries, is at a distance from the other divisions of the forest. It contains about 200,000 acres and is western white pine land of the best quality. Although much of the area supports only reproduction and young growth, there are some excellent stands of virgin western white pine, most of them under private ownership. The "North and South Highway" makes the Palouse division readily accessible.

The main division of the forest is entirely without roads, and all travel must be on foot or by saddle horse. Because of this relative inaccessibility there is very good fishing in the interior. Deer and bear are plentiful, and small herds of elk are found in the more remote regions. The "Sawteeth" are frequented by mountain goats.

The St. Joe Forest suffered severely from the great 1910 forest fires, which destroyed some of the finest stands of western white pine in Idaho. Fortunately much of this burned area is reforesting naturally, and very extensive plantations have been made by the Forest Service on the most severely burned slopes. There still remains a large body of virgin western white pine timber in the central parts of the forest, capable of producing a yearly cut of 25,000,000 feet. Much of this timber is mature, and lumbering operations are increasing.

CLEARWATER NATIONAL FOREST

The Clearwater National Forest lies between the St. Joe National Forest on the north and the Selway National Forest on the south. Its eastern boundary is the Idaho-Montana State line, which follows the crest of the Bitterroot Mountains.

The historic Lolo Trail, used by the Nez Perce Indians to reach the buffalo hunting grounds, follows the divide between the North Fork of the Clearwater River and the Lochsa River, and forms the southern boundary of the forest. This old Indian trail was followed in part by Lewis and Clark on their expedition to the Pacific coast in 1805. It was later improved by the United States Army, under Captain Bird and Major Truax. Over this old trail Chief Joseph made part of his masterly retreat from General Howard during the Nez Perce Indian War. The trail is now kept in repair by the Forest Service and forms one of the main lines of travel through the region.

The country is rough and difficult of access, having practically no automobile or wagon roads, and as in the St. Joe and Selway Forests, practically all traveling has to be done on foot or horseback.

There are approximately 4,441 million board feet of timber on this forest, but because of its inaccessibility little is now being cut. Exceptionally heavy losses of timber occurred on the Clearwater Forest during the 1910 fires. Most of these areas are gradually being restocked with tree growth, but some will probably require planting. Some of the burned areas can be used for a few years for

the grazing of sheep, and there are some permanent range lands. About 14,000 head of sheep are grazed here each year, some of them being brought in from adjoining States.

Most of the streams, especially those which are more remote from civilization, offer fine trout fishing. The big-game hunter can usually get his quota of deer, elk, or bear in the back country of this forest.

SELWAY NATIONAL FOREST

The Selway National Forest extends from the prairies of central Idaho on the west to the summit of the Bitterroot Mountains on the east, and contains over 1,750,000 acres. It embraces a wide variety of geographic and climatic conditions. The climate at the lower elevations, on the Selway River, near the western boundary, is mild, while severe winters and short summers are characteristic of the higher country in the eastern part.

Only a small part of the forest along the main streams is accessible by road. The remainder is traversed by trails which lead into a real wilderness at the higher altitudes in the interior.

The timber stand is estimated at 6,776 million board feet. Cedar is one of the most important trees. The cutting of this species is increasing on the forest with the development of the pole industry.

All varieties of big game, including moose, are found in considerable numbers on the headwaters of the Lochsa and Selway Rivers. The largest herds of elk and moose in Idaho are found in the Selway Game Preserve in the interior of the Selway Forest.

Kooskia, Idaho, the western entrance to the region, is reached by the Clearwater Branch of the Northern Pacific Railway. The forest may also be entered by trail from Montana on the east by way of Darby or Hamilton, or from Missoula by the road up Lolo Creek to Lolo Pass.

There are no hotels or resorts on the forest. Horses and outfits for trips may be obtained at Kooskia, Idaho, and Hamilton or Darby, Mont.

NEZPERCE NATIONAL FOREST

The Nezperce National Forest extends from the southern boundary of the Selway National Forest south to the Salmon River, which separates north Idaho from south Idaho. The forest contains two units, one reaching to Oregon on the west and the other to Montana on the east. These two units are separated only by the precipitous canyon of the Salmon River, extending from Riggins to Whitebird. Through this trough runs the only north-and-south highway connecting the two sections of the State, although more roundabout routes are available by way of Oregon or Montana. The upper reaches of the Salmon River, with its deep canyon, form the southern boundary of the forest for more than 100 miles.

With the possible exception of the Grand Canyon, no other canyon of equal length in the United States has resisted settlement and development so effectively as has the canyon of the Salmon River. Every year a selected party of sportsmen and adventurers

goes down the Salmon River from Salmon City about 200 miles in a specially constructed boat. This part of the river is replete with rapids, and the voyage, according to the few who have taken it, is one of the most exciting trips on the continent.

The name Nez Perce (from the French "Nez Percé" or "pierced nose") was applied by the early French voyageurs to the tribe of Indians inhabiting the locality. The region now included in the forest was used by the Indians as hunting and fishing grounds, and big game is still fairly abundant there.

The forest is rich in historical material concerning the pioneers who searched for gold in the early days. Prospecting and mining have continued until the present time, and many millions of dollars worth of placer gold have been removed, although many of the once-flourishing camps are now deserted.

Heavy stands of western yellow pine of good quality are found over extensive areas, and it is estimated that there are approximately 5 billion board feet of timber of all species on the forest. Up to the present time very little lumbering has been done, owing to the inaccessibility of the timber. Eventually this storehouse will be opened up and will help meet the demand for timber.

Stock grazing constitutes the chief use of the forest at the present time. The steep, open sidehills furnish range for about 34,000 sheep and 6,000 cattle each year. A few ranches located on near-by river bars or benches are used for wintering the stock, but the owners are entirely dependent upon the forest for summer range. Most of the stock, however, is brought to the national-forest range from considerable distances north and west.

IDAHO NATIONAL FOREST

South of the Salmon River lies the Idaho National Forest, very similar in many ways to the Nezperce Forest, on the north. The Idaho Forest lies on the great granite uplift of central Idaho, which is cut by numerous deep canyons that drain northward into the main Salmon River. Entrance into the region from the south is very difficult because high ridges must be crossed that are free from snow only during a brief summer season. A road from McCall, the headquarters of this forest, crosses from the headwater of the Payette River into the Salmon River drainage and forms the only means of communication with the back country. This road, after encircling the lower end of Payette Lake, extends north as far as the little mining town of Warren and terminates about 30 miles southeast of Warren, at Edwardsburg.

Gold-bearing ore exists in many parts of this region, and several small mines are in operation. The country is undeveloped, except for these small scattered mines and the ranches along the Salmon River and its main tributaries. There are tremendous timber resources on this forest, but they can not be generally exploited until the whole Salmon River Valley is developed. The chief exception is the extreme southwestern portion of the forest, which lies on the drainage of the Payette River and is readily accessible. It contains good stands of timber, which are being utilized at the present time.

The Idaho Forest consists in general of a wild, undeveloped country with tremendous forest resources, the protection of which is, at the present time, the most important problem.

WEISER NATIONAL FOREST

South and west of the Idaho National Forest lies the Weiser National Forest, a relatively small forest lying like a horseshoe around the head of the Weiser River. The drier climate of southwestern Idaho is definitely felt here, and the ridge tops and south slopes are very largely covered with grass. Consequently grazing is very important. Also, there are excellent stands of timber, especially western yellow pine, which are generally accessible and are located not far from agricultural settlements in the Weiser

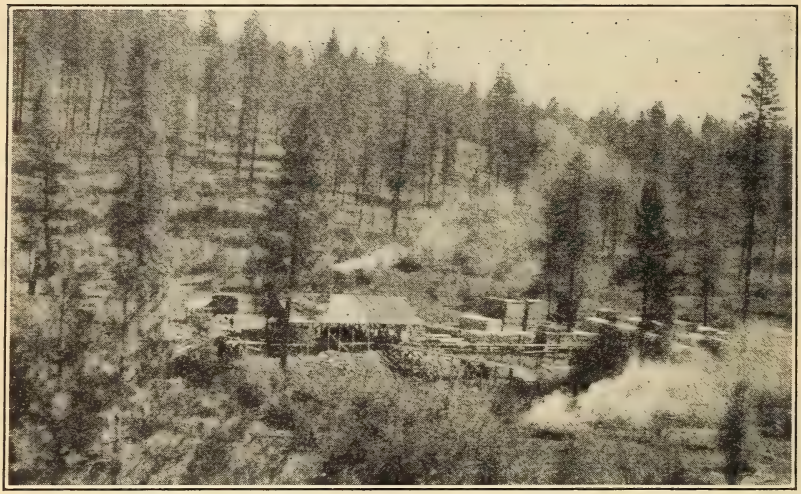

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FIG. 10.—Because of the accessibility of the Weiser National Forest, many small sawmills operate in its pine stands

Valley. There is a very fair demand for timber products, averaging about a million board feet a year. (Fig. 10.)

A narrow neck of the forest lying on the divide between the head of the Weiser River and the Little Salmon River is crossed by the North and South Highway. The forest may also be entered by a road from Council, which leads to the old mining camp at Cuprum, near the center of the forest. Other minor roads touch the edge of the forest at various points.

PAYETTE NATIONAL FOREST

Lying directly south of the Idaho National Forest is the Payette National Forest, located for the most part upon the drainage of the various branches of the Payette River. Along the main (north) fork are considerable areas of high valley land, in what are known as Long Valley and Round Valley, that are suitable for agriculture. These lands are not included within the Payette Forest, although

the mountain lands fringing the valley on either side form part of the forest.

The Payette Forest contains large stands of timber and is also important from the standpoint of grazing. Also from its protected watersheds the Payette River draws supplies for watering 123,000 acres. The North Fork of the Payette is followed not only by the railroad but by a highway and the South Fork is followed by a road as far as the little settlement of Lowman. The Middle Fork and most of the tributaries are at present accessible only by trail. There are no serious topographic barriers to the development of this forest, and the timber can be expected to become marketable as fast as a demand for it develops. The fishing is good along the various forks of the Payette River.

BOISE NATIONAL FOREST

South of the Payette National Forest lies the Boise National Forest, a great area of timberland located chiefly upon the headwaters of the Boise River. The region is mountainous, without marked ranges except along its eastern edge where the rugged Sawtooth Range separates it from the Sawtooth National Forest. It may be entered by several routes; one road leads from the old mining camp of Idaho City across the mountains to Lowman on the South Fork of the Payette River, and another from the south enters the forest by way of Rocky Bar and the mining camp of Atlanta. The rest of the forest is well covered with trails.

This forest contains a great store of timber quite accessible to centers of population in the Boise Valley as well as to the general market. It is also of great importance to the farmers of the region, for the protection of its watersheds is necessary not only to prevent dangerous floods but to insure an adequate supply of water and to prevent the silting up of the Arrowrock Reservoir.

Sheep, cattle, and horses in considerable numbers graze on this forest. The more accessible parts are much frequented by automobile campers and even the less easily accessible portions of the Sawtooth Range are visited annually by a considerable number of determined explorers.

SAWTOOTH NATIONAL FOREST

Directly east of the Boise National Forest and separated from it by the crest of the Sawtooth Range lies the Sawtooth National Forest. On this eastern side of the Sawtooth Range begins a very different set of conditions. The tree growth of the mountains becomes decidedly less. Western yellow pine, a valuable timber species, disappears. Larger open areas of grass and sagebrush occupy the ridges and more exposed slopes. These changes are brought about by the sudden change in rainfall on the leeward side of the Sawtooth Range. Although timber values are naturally less in these drier forests, grazing assumes a more important place, and on the Sawtooth Forest sheep grazing especially.

A number of small settlements are located close to the forest and in spite of the somewhat inferior timber stands several small sawmills are in operation cutting lumber for local consumption.

The Sawtooth Forest is best known on account of a series of lakes lying behind the glacial moraines at the mouths of several canyons issuing from the highest of the Sawtooth Peaks. These lakes are known as the Redfish Lakes. They are beautiful bodies

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FIG. 11.—Type of western yellow pine timberland found on the Boise and neighboring forests

of water set against a background of mountains, and the region about them is much frequented for recreation. Mount Hyndman, the highest mountain in Idaho, lies on the boundary between the Sawtooth and Lemhi Forests. (Fig. 12.)

CHALLIS NATIONAL FOREST

North of the Sawtooth National Forest lies the Challis National Forest, drained by various tributaries of the Salmon River. As the eastern edge of this forest is bounded by no lofty mountain range such as the Sawtooth Peaks, there is no very sudden change between the general character of the Challis National Forest and that of the Payette and Idaho National Forests to the west of it. There is, however, a general decrease in the luxuriance of the timber, and lodgepole pine tends to constitute a greater portion of the forest.

Large sections of the Challis are out of the way and difficult to reach, although roads, most of them cheaply constructed, have been built from time to time to various scattered mining camps. A road known as the Morgan Creek Road, now under construction, will eventually link the back country of this forest with the town of Challis.

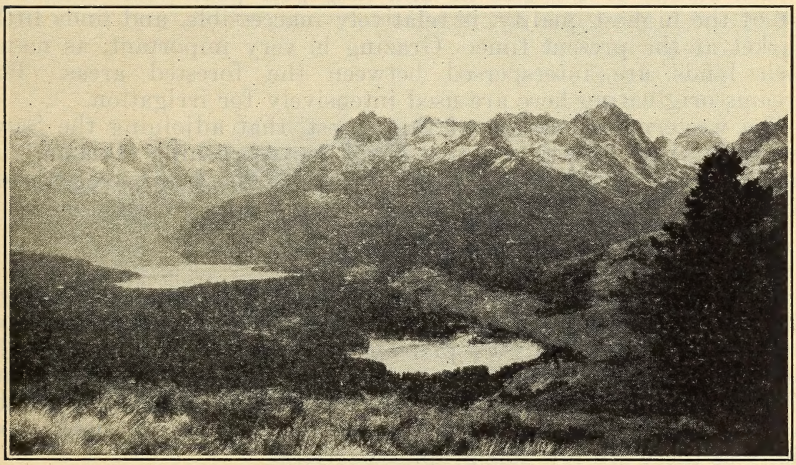

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FIG. 12.—At the mouth of many canyons on the Sawtooth National Forest are lakes of glacial origin

As there is relatively little livestock owned in the neighborhood, this forest is not used for grazing to any great extent. The western portion of the forest contain interesting stretches of little-known wild country in whcih big game is still to be found.

SALMON NATIONAL FOREST

The Salmon National Forest, lying for the most part between the Challis and the Nezperce Forests, is very similar to them in many respects. A good deal of it is lower country than the Challis, however, and that along the main Salmon River seems to be better watered. Consequently the timber is again more thrifty, and western yellow pine assumes a position of considerable importance in the stands. The adjacent agricultural valleys are also more productive and support a larger population, so that the forest is more heavily used, both as a source of timber and forage.

Along the western edge of the forest lies some rough interesting country that can be reached only by pack trails. A portion of the forest is crossed by a road leading from Salmon City through Gibbon's Pass into the Bitter Root Valley of Montana, and isolated strips also lie upon the Beaver Head and Lemhi Mountain Ranges. These are steep-sided, narrow ridges with rocky, barren crests fringed by belts of Douglas fir and lodgepole pine alternating with open grazing lands.

LEMHI NATIONAL FOREST

East of the Sawtooth and Challis National Forests lie a number of isolated masses of timberland which are administered collectively as the Lemhi National Forest. The Little Lost River Mountains, spurs of the Beaverhead Range, and the eastern slopes of spurs of the Sawtooth Range are included in this forest. These mountains, especially the Lost River Mountains, are steep and rugged, with broken stands of Douglas fir and lodgepole pine. The timber is not of the highest quality, is relatively inaccessible, and finds little market at the present time. Grazing is very important, as many open lands are interspersed between the forested areas. The streams originating here are used intensively for irrigation.

The westernmost section of this forest, that adjoining the Sawtooth National Forest, contains many famous fishing streams. In the valleys between the separated sections of the forest are some of the few survivors of the once numerous herds of antelope.

TARGHEE NATIONAL FOREST

In the northeastern corner of the Idaho, against the Yellowstone National Park, lies the Targhee National Forest, occupying low broken mountains and lava plateaus that encircle the head of the Snake River. The valleys are well settled, and both the Butte and Yellowstone branches of the Oregon Short Line Railroad cross the forest. Under these circumstances the forest is heavily used, especially as there are few topographic barriers.

Its timber stands are predominantly lodgepole pine, which is finding a ready market as railroad ties, many thousands of which are cut and shipped every year. In many parts of the forest there are good grazing lands, and since livestock is one of the principal industries of the neighboring valleys, the demand for grazing privileges is heavy, and many sheep and cattle are run on this forest. The forest is of great value for watershed protection as well, since here are the headwaters of a good part of the Snake River. (Fig. 13.)

CARIBOU NATIONAL FOREST

South of the Targhee National Forest and lying against the Wyoming State line is the Caribou National Forest. It consists of a number of broken mountain ranges and contains only small stands of timber—Douglas fir and lodgepole pine. In addition to these species, the broadleaf aspen is a prominent component of the mountain forest, becoming more and more plentiful southward. On both sides the forest lies close to valleys where livestock grazing and

dairying are important industries, so that the Caribou Forest is of great value for the summer grazing of the large flocks of sheep and herds of cattle owned in the vicinity. It is generally accessible and has a number of wagon roads and woods roads, as well as two automobile roads which connect Star Valley on its east edge with railroad points on its west side. Tributaries of the Bear and Snake Rivers rise upon this forest, and nearly every small creek is used for local irrigation. The forest, therefore, is of outstanding public value to the citizens of the locality.

CACHE NATIONAL FOREST

The Cache National Forest is located mainly upon the Bear River drainage, extending southward from Idaho into Utah, with smaller divisions of the forest on near-by minor mountain ranges.

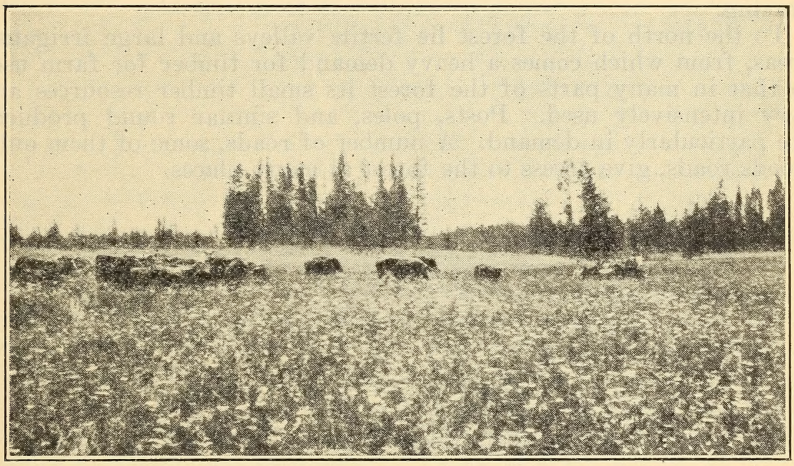

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FIG. 13.—Cattle grazing on the extensive open lands that mark the national forests of southeastern Idaho

These minor ranges are poorly forested, and the Bear River Range itself supports heavy stands of timber only in a few favored localities. Near by are thickly populated agricultural valleys and a large number of towns. The oldest settlements in southern Idaho are in this vicinity, and the timberlands, which have always been rather scanty, were drawn upon very heavily in the early days for the upbuilding of these communities. Fires also have materially reduced timber resources. In general, however, second-growth forests are coming in, and the forests are gradually recuperating from the heavy cutting of the early days. Owing to the large livestock holdings in the adjacent valleys, there is a heavy demand for grazing on the large areas of excellent grazing land. In 1924 about 25,000 cattle and 93,000 sheep grazed on the ranges of the Cache.

As every stream is utilized for irrigation, watershed protection is of paramount importance. Woods roads run up nearly every canyon, but some of them are scarcely usable as roads. The forest is

open and it is possible to go everywhere, even without trails. The main division of the forest is crossed by one road in Idaho and another farther south, in Utah. Both roads are much used by automobile traffic, especially by recreation seekers from the towns on the west side of the mountains going fishing and to resorts on Bear Lake and its vicinity. Forest headquarters are at Logan, Utah.

MINIDOKA NATIONAL FOREST

The Minidoka National Forest lies chiefly in south Idaho close to the Utah State line. One of its five divisions lies just over the line in Utah. The mountain ranges upon which the forest is located lie on the edge of the deserts, and in general, support poor stands of timber, although patches of Douglas fir and lodgepole pine are found in certain localities. The great areas of grassland play an important rôle in watershed protection as well as furnishing valuable grazing.

To the north of the forest lie fertile valleys and large irrigated areas, from which comes a heavy demand for timber for farm use, so that in many parts of the forest its small timber resources are very intensively used. Posts, poles, and similar round products are particularly in demand. A number of roads, some of them only woods roads, give access to the forest at many places.

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